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EXAMINER	
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/361,020	ISELI ET AL.	
	Examiner	Art Unit	
	Eliseo Ramos-Feliciano	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11,12,14 and 27-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11,12,14 and 27-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Art Unit – Notice

1. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 13, 2006 has been entered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 11-12, 14, 27-32, 35, and 40-47** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bary et al. (US Patent Number 5,822,273) in view of Savit (US Patent Number 3,990,036).

Regarding **claim 11**, Bary et al. discloses a seismic acquisition system (Figure 1 and column 2, line 45 to column 4, line 14, especially column 2, lines 45-67), including:

one or more sensors (RTU – Figure 1; depicted in Figure 2) adapted to sense conditions and generate signals representative of the sensed conditions, the one or more sensors including a memory (M1, M2, M3 or Mp – Figure 2) for storing the signals (see column 4, lines 54-66, column 6, lines 55-57);

a base station (LS – Figure 1; depicted in Figure 3) operably coupled to the sensors for receiving and transmitting the signals, the base station (LS) including a memory (buffer memory DCu and/or storage MM – Figure 3) for storing the signals (see column 5, lines 5-10, column 8, lines 12-35, especially lines 31-35); and

a recorder (SCC 1) operably coupled to the base station (LS) for storing the signals (see column 5, lines 11-17, column 13, lines 7-9).

Bary et al. discloses that each sensor (RTU) includes a processor (DSP 19) for carrying out computations necessary for determining a specific emission window (time slot) for the sensor (RTU), for example, when the number of channels (frequencies) is less than the total number of sensors (RTU) (column 6, lines 62-64). Therefore, Bary et al. teaches that each sensor (RTU) selects/controls a time slot assignment for transmitting the signals as claimed.

However, Bary et al. fails to specifically mention that each sensor selects a channel (frequency) assignment for transmitting the signals as claimed.

In the same field of endeavor, Savit discloses seismic sensors that select a channel assignment for transmitting the signals. In the case of multichannel sensors, a switching system must be used to change channel assignments (column 1, lines 45-47). Each sensor is equipped with the switching means (column 1, line 64). Because each of the sensors comprise the explained switching mechanism <u>and</u> such switching mechanism is in fact used to change (select)

channel assignments, each of the explained seismic sensors select a channel assignment for transmitting the signals as claimed, by means of the explained switching mechanism.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to adapt Bary et al.'s sensors to select a channel assignment for transmitting the signals as claimed, for the advantage of more secure communications since either or both of frequency hopping and frequency division multiplexing can be achieved.

Regarding **claim 27**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 11*). In addition, Bary et al. discloses a communication link having at least one channel (radio channel or line – column 8, lines 12-16) for providing communication between the one or more sensors (RTU) and the base station LS (Figure 1 and abstract).

Regarding **claims 28-29**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 27*). In addition, Bary et al. discloses that the one or more sensors (RTU) comprise N sensors (BA – Figure 1), the base station further comprises M base stations (LS1 to LSn), the at least one communication channel further comprising M frequency bands (fk1 to fkq) divided up into time slots ("time window") (see column 9, lines 10-29, column 11, lines 31-40; also column 5, line 57 to column 6, line 14).

However, the combination does not specify "N+1" as claimed.

Nevertheless, Bary et al. does teach that each sensor (acquisition unit - RTU) has its own time slot ("time window") (column 9, line 24). It is inherent that the base station needs to transmit control information to the sensors. Therefore, N time slots (one per sensor) plus a control information time slot equals N+1 time slots.

For clarification, claim 28 requires N sensors and N+1 time slots. Claim 29 further specifies that N time slots out of the N+1 time slots correspond to the N sensors, wherein the N time slots are used for communications from the sensor to the base station. The extra time slot (+1) is a "one time slot" for communication of information from the base station to the sensor. Barry et al. teaches N sensors and one time slot (time window) per sensor. However, fails to specify the extra "one time slot" ("+1" of N+1). Nevertheless, in Bary et al. the *need* to transmit information (for example, control information) from base station to sensor is inherent as stated in the rejection. But the claim requires more than that, that is, a particular *way* this information is transmitted (via the claimed "+1" time slot). See MPEP 2112.

Bary et al. fails to explicitly teach the claimed "one time slot" (+1). But suggests time slots for information communication and because there is an inherent need to transmit information from base station to the sensor, therefore, it is considered obvious to use a time slot for communications from the base station to the sensor (for example, control information).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the combination with N+1 time slots, one per sensor plus one for control information for the advantage of improved transfer efficiency.

Regarding **claim 30**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 27*). In addition, Bary et al. discloses that the at least one channel is divided up into time slots ("time window"), wherein the time slots include signaling bit, status bit, seismic information (abstract) and guard time (time break; column 10, line 3) (see column 9, lines 10-29, column 11, lines 31-40; also column 5, line 57 to column 6, line 14).

Regarding **claims 31-32**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 27*). In addition, Bary et al. discloses at least one processor (CPU / DCu – Figure 3, CRTU / CiV – Figure 4 and/or microprocessor 2 – Figure 2) associated with the base station and the one or more sensors operating according to a set of programmed instructions (inherent) for determining one or more communication parameters between the one or more sensors and the base station. The set of programmed instructions includes instructions for determining at least one of a channel assignment, a time slot and a frequency for sending information between the one or more sensors and the base station. For example, channel assignment (see column 5, lines 40-44, column 8, lines 12-16, 57-60, column 9, lines 6-29).

Regarding **claim 35**, Bary et al. discloses everything claimed as applied above (see *claim 11*). However, Bary et al. fails to specifically disclose a dedicated communication link for coupling the sensors to the recorder.

Nevertheless, Bary et al. discloses that the recorder (SCC) includes substantially the same structure and the same functional blocks as those described in connection with the base station (LS) (column 12, lines 42-45). Also that the recorder (SCC) and the base station (LS) can be combined together (column 14, lines 12-17).

Following these suggestions, therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide Bary et al. with a dedicated communication link for coupling the sensors to the recorder because some sensors can be close enough to the recorder station so to avoid unnecessary signaling with the base station (LS).

For clarification, claim 35 requires a dedicated communication link for coupling the sensors to the recorder. Bary et al. in Figure 1 shows a recorder (SCC), base station (LS_1), and

sensor (RTU/BA_{11}). Communication between SCC and LS_1 is via frequency channel F_1 (link). Communication between LS_1 and sensor is via frequency channel fk_1 (link) which is "specific" (dedicated) to each group/sensor (column 9, lines 17-19). It is also a "particular frequency" (dedicated communication link) assigned by setting the sensor (BA_{11}) (column 5, lines 57-62). Frequency channel F_1 and frequency channel fk_1 are different. Base station (LS_1) acts as a relay or repeater because sensors can be very distant (distributed over an exploration zone – column 2, lines 45-51).

In an alternative embodiment, Barry et al. teaches combining recorder (SCC) and base station (LS_1) to form a single station (column 14, lines 13-17). Given the fact that there is a dedicated communication link between the base station and the sensor, when recorder (SCC) and base station (LS_1) are combined together in a single station, as suggested by Barry et al., the same dedicated communication link would exist between the new single station, now the "recorder" as claimed, and the sensor.

From Figure 1, it can be noted that the base station (LS_1) is in closer proximity to the sensor than the recorder (SCC). Therefore, when the sensors are in close proximity to the recorder (that is, when recorder SCC and base station LS_1 are combined in a single station), there is no need for an intermediary base station LS; therefore, unnecessary signaling with an intermediary base station is avoided or eliminated, for example, saving frequency channel F_1 which is a valuable communications resource.

Regarding **claim 12**, Bary et al. discloses a method of communicating in a seismic acquisition system having sensors (RTU), base stations (LS) and a recorder (SCC) (Figure 1 and column 2, line 45 to column 4, line 14, especially column 2, lines 45-67), including:

storing data in the sensors (RTU) (column 6, lines 55-56);

transmitting data from the sensors (RTU) to the base stations (LS) (column 11, lines 30-40);

storing data in the base stations (LS) (column 8, lines 31-35); and

transmitting data from the base stations (LS) to the recorder (SCC) (column 12, lines 54-60, and abstract).

Bary et al. discloses that each sensor (RTU) includes a processor (DSP 19) for carrying out computations necessary for determining a specific emission window (time slot) for the sensor (RTU), for example, when the number of channels (frequencies) is less than the total number of sensors (RTU) (column 6, lines 62-64). Therefore, Bary et al. teaches that each sensor (RTU) selects/controls a time slot assignment for transmitting the signals as claimed.

However, Bary et al. fails to specifically mention that each sensor selects a channel (frequency) assignment for transmitting the signals as claimed.

In the same field of endeavor, Savit discloses seismic sensors that select a channel assignment for transmitting the signals. In the case of multichannel sensors, a switching system must be used to change channel assignments (column 1, lines 45-47). Each sensor is equipped with the switching means (column 1, line 64). Because each of the sensors comprise the explained switching mechanism <u>and</u> such switching mechanism is in fact used to change (select) channel assignments, each of the explained seismic sensors select a channel assignment for transmitting the signals as claimed, by means of the explained switching mechanism.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to adapt Bary et al.'s sensors to select a channel assignment for

transmitting the signals as claimed, for the advantage of more secure communications since either or both of frequency hopping and frequency division multiplexing can be achieved.

Regarding **claim 14**, Bary et al. discloses a seismic acquisition system (Figure 1 and column 2, line 45 to column 4, line 14, especially column 2, lines 45-67), including:

a plurality of rows of sensor stations (RTU: GR1 to GRn – Figure 1; depicted in Figure 2) for sensing conditions and transmitting signals representative of the sensed conditions (see column 4, lines 54-66, column 6, lines 55-57);

a plurality of base stations (LS1 to LSn – Figure 1; depicted in Figure 3) coupled to the rows of sensor stations for receiving and transmitting the signals; and

a recorder (SCC 1) operably coupled to the base stations for receiving the signals (see column 5, lines 11-17, column 13, lines 7-9, and abstract).

Bary et al. discloses that each sensor (RTU) includes a processor (DSP 19) for carrying out computations necessary for determining a specific emission window (time slot) for the sensor (RTU), for example, when the number of channels (frequencies) is less than the total number of sensors (RTU) (column 6, lines 62-64). Therefore, Bary et al. teaches that each sensor (RTU) selects/controls a time slot assignment for transmitting the signals as claimed.

However, Bary et al. fails to specifically mention that each sensor selects a channel (frequency) assignment for transmitting the signals as claimed.

In the same field of endeavor, Savit discloses seismic sensors that select a channel assignment for transmitting the signals. In the case of multichannel sensors, a switching system must be used to change channel assignments (column 1, lines 45-47). Each sensor is equipped with the switching means (column 1, line 64). Because each of the sensors comprise the

explained switching mechanism and such switching mechanism is in fact used to change (select) channel assignments, each of the explained seismic sensors select a channel assignment for transmitting the signals as claimed, by means of the explained switching mechanism.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to adapt Bary et al.'s sensors to select a channel assignment for transmitting the signals as claimed, for the advantage of more secure communications since either or both of frequency hopping and frequency division multiplexing can be achieved.

Regarding **claim 40**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 14*). In addition, Bary et al. further discloses one or more wireline communication links for coupling the sensor stations and the base stations (see the wireline between GRi and LSi – Figure 1).

Regarding **claim 41**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 40*). In addition, Bary et al. further discloses that the wireline communication link comprises a twisted pair communication link (column 8, line 16).

Regarding **claim 42**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 41*). In addition, Bary et al. teaches high-rate (high-speed) transmission channels, for example between 40 and 125 Mbps (column 8, lines 17-18). By definition this includes one or more of: an asymmetric digital subscriber loop, a high speed digital subscriber loop, a very-high speed digital subscriber loop, a T1 connection, or an E1 connection, as claimed.

Regarding **claim 43**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 40*). In addition, Bary et al. further discloses that the wireline communication link includes a coaxial communication link (column 8, line 18).

Regarding **claim 44**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 43*). In addition, Bary et al. teaches high-rate (high-speed) transmission channels, for example between 40 and 125 Mbps (column 8, lines 17-18). By definition this includes one or more of: an Ethernet connection, a T4 connection, or an E4 connection, as claimed.

Regarding **claim 45**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 40*). In addition, Bary et al. further discloses that the wireline communication link comprises a fiber optic communication link (column 8, line 18).

Regarding **claim 46**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 45*). In addition, Bary et al. teaches high-rate (high-speed) transmission channels, for example between 40 and 125 Mbps (column 8, lines 17-18). By definition this includes one or more of: an FDDI fiber optic backbone, or an OC-3 connection, as claimed.

Regarding **claim 47**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 14*). In addition, Bary et al. further discloses one or more wireline communication links for coupling the base stations and the recorder (see the wireline between SCC and LSi – Figure 1).

5. **Claims 14, 36-39 and 48-49** are rejected under 35 U.S.C. 103(a) as being unpatentable over Longaker (US Patent Number 6,226,601) in view of Bary et al. (US Patent Number 5,822,273) and further in view of Savit (US Patent Number 3,990,036).

Regarding **claim 14**, Longaker discloses a seismic acquisition system (Figure 10; column 2, lines 1-16; also Figure 2), including:

a plurality of rows of sensor stations (1005, 1010, 1015 – Figure 10; 205, 210, 215 – Figure 2) for sensing conditions and transmitting signals representative of the sensed conditions (column 7, lines 40-42; column 4, lines 4-10);

a plurality of base stations (1020 to 1075 – Figure 10) coupled to the rows of sensor stations for receiving and transmitting the signals (column 7, lines 43-46); and

a recorder (1090 and 1080) operably coupled to the base stations for receiving the signals (column 7, lines 47-49).

However, Longaker fails to specifically mention each sensor being adapted to control a channel (frequency) assignment and a time slot for transmitting the signals as claimed.

In the same field of endeavor, Bary et al. discloses seismic sensors wherein each sensor (RTU) includes a processor (DSP 19) adapted to carry out computations necessary for determining a specific emission window (time slot) for the sensor (RTU), for example, when the number of channels (frequencies) is less than the total number of sensors (RTU) (column 6, lines 62-64). Therefore, Bary et al. teaches each sensor (RTU) being adapted to control a time slot assignment for transmitting the signals as claimed.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to adapt Longaker's sensors to control a channel assignment for transmitting the signals as claimed, for the advantage of more secure communications since either or both of time hopping and time division multiplexing can be achieved.

However, Longaker and Bary et al. fail to specifically mention each sensor being adapted to control a channel (frequency) assignment for transmitting the signals as claimed.

In the same field of endeavor, Savit discloses seismic sensors adapted to control a channel assignment for transmitting the signals. In the case of multichannel sensors, a switching system must be used to change channel assignments (column 1, lines 45-47). Each sensor is equipped with the switching means (column 1, line 64).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to adapt Longaker and Bary et al.'s sensors to control a channel assignment for transmitting the signals as claimed, f or the advantage of more secure communications since either or both of frequency hopping and frequency division multiplexing can be achieved.

Regarding **claims 36-39**, Longaker, Bary et al. and Savit disclose everything claimed as applied above (see *claim 14*). In addition, Longaker teaches one or more cellular wireless communication links for coupling the sensor stations and the recorder, as well as one or more cellular wireless communication links for coupling the base stations and the sensor stations (see Figure 10, column 2, lines 50-56, column 4, lines 26-36, column 7, lines 40-49).

In addition, Longaker further teaches that the cellular wireless communication links include one or more of: frequency division: multiple access (FDMA); time division multiple access (TDMA); and code division multiple access (CDMA) (column 2, lines 5-7, column 3, lines 4-12, *inter alia*).

Regarding **claim 48**, Longaker, Bary et al. and Savit disclose everything claimed as applied above (see *claim 14*). In addition, the combination of elements depicted in Figure 2 of Longaker can be characterized as a "wireless master sensor station". The wireless master sensor station (Figure 2) includes:

a transceiver (inherently located at 245) for transmitting and receiving information including a directional antenna (for example: directional sector antenna 240) (see column 4, lines 12-15, 51-52; column 5, line 58);

a control module (inherent) coupled to the transceiver for monitoring and controlling the operation of the wireless master sensor station (Figure 2); and

a sensor module (205-215) coupled to the control module for sensing conditions and generating signals representative of the sensed conditions (see column 7, lines 40-42; column 4, lines 4-10).

Regarding **claim 49**, Longaker, Bary et al. and Savit disclose everything claimed as applied above (see *claim 14*). In addition, Longaker teaches a hierarchical cell structure (abstract, column 2, lines 50-53), wherein the combination of elements depicted in Figure 2 of Longaker can be characterized as a "picocell base station". The picocell base station (Figure 2) includes: a first cellular transceiver including a first antenna (e.g. for sector 240); a second cellular transceiver including a second antenna (e.g. for sector 236); a third cellular transceiver including a third antenna (e.g. for sector 232); a radio transceiver including a radio antenna (e.g. for communicating with "Layer 2" base station: step 20 – Figure 1); a control module (inherent for operation of the station) coupled to the first, second and third cellular transceivers and the radio transceiver; a first wireline interface (inherent for communication and functionality of the station / first sector) coupled to the control module; a second wireline interface (inherent for communication and functionality of the station / second sector) coupled to the control module; and a third wireline interface coupled (inherent for communication and functionality of the station / third sector) to the control module. See column 4, lines 4-37, column 7, lines 40-49.

6. **Claim 33** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bary et al. (US Patent Number 5,822,273) in view of Savit (US Patent Number 3,990,036) and further in view of Light et al. (US Patent Number 5,930,293).

Regarding **claims 33**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 11*). In addition, Bary et al. discloses that the base station (LS) includes: a transceiver (CRTU Tx/Rx – Figures 4-5), and two distinct antennas (21 & 25 – Figure 5).

However, the combination fail to specifically disclose a diversity antenna and a directional antenna as claimed. Nevertheless, base station LS acts as a base station repeater between SCC and RTU – Figure 1.

In the same field of endeavor, Light et al. discloses a base station repeater (Figure 5) that includes a transceiver (402), one or more receive diversity antennas (411 & 413) and one or more transmit directional antennas (415) (see column 2, line 66 to column 3, line 15). One advantage of Light et al.'s invention is to improve signal quality reception by mitigating the effects of fading (e.g. Rayleigh fading – column 1, line 34; column 2, line 14) while improving re-transmission efficiency by directionally transmitting to a particular receiving base station (401 – Figure 4).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the combination's base station (LS) with one or more diversity antennas and one or more directional antennas as taught by Light et al. for the advantage of improving signal quality reception by mitigating the effects of fading while improving re-transmission efficiency.

7. **Claim 34** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bary et al. (US Patent Number 5,822,273) in view of Savit (US Patent Number 3,990,036) ("Savit '036"), further in view of Light et al. (US Patent Number 5,930,293), and further in view of Savit (US Patent Number 4,066,993) ("Savit '993").

Regarding **claims 34**, Bary et al. and Savit '036 disclose everything claimed as applied above (see *claim 11*). In addition, Bary et al. discloses that the recorder (SCC) includes substantially the same structure and the same functional blocks as those described in connection with the base station (LS) (column 12, lines 42-45). Consequently, the recorder (SCC) includes two distinct antennas (21 & 25 – Figure 5).

However, the combination fail to specifically disclose a diversity antenna <u>and</u> a microwave antenna as claimed.

Diversity antennas are known to be advantageous for improving signal quality reception by mitigating the effects of fading as taught by Light et al. (see column 1, line 34; column 2, line 14, column 2, line 66 to column 3, line 15; see also discussion above for claim 33).

Microwave antennas are known to be advantageous for low-power consumption as taught by Savit '993, who teaches substituting a radio antenna by a microwave antenna for low-power consumption advantages in a seismic system (see column 6, lines 48-64).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the combination's recorder (SCC) with a diversity antenna and a microwave antenna in place of antennas 21 and 25 for the advantage of improving signal quality reception by mitigating the effects of fading and advantageous for low-power consumption, respectively.

8. **Claim 50** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bary et al. (US Patent Number 5,822,273) in view of Savit (US Patent Number 3,990,036), and further in view of Longaker (US Patent Number 6,226,601).

Regarding **claim 50**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 12*). In addition, Bary et al. discloses that transmitting information from the sensors to the base stations, includes:

listening for an open time slot ("time window"), and frequency (see column 9, lines 10-29, column 11, lines 31-40; also column 5, line 57 to column 6, line 14);

requesting use of the available time slot from the base station (inherent);

if the base station is not operating at full capacity, then capturing the open time slot and transmitting to the base station (column 9, lines 17-29).

If the base station is not operating at full capacity the step "if the base station is operating at full capacity, then reducing the overall data for the base station" does not occur.

However, the combination fails to specifically disclose a "sector" as claimed.

In the same field of endeavor Longaker discloses a method of communicating in a seismic acquisition system (Figure 10; column 2, lines 1-16; also Figure 2) having sensors (1005, 1010, 1015 – Figure 10; 205, 210, 215 – Figure 2), base stations (1020 to 1075 – Figure 10) and a recorder (1090 and 1080).

The base stations include sectors (e.g. 230-240 – Figure 2). The system may operate under frequency multiple access (FDMA); time division multiple access (TDMA); and code division multiple access (CDMA) (column 2, lines 5-7, column 3, lines 4-12, *inter alia*). Therefore, listening for an open time slot, frequency, and sector. For example, if the sector is

available. The advantage of Longaker's sectors is to achieve higher density communications since more sensors can be serviced per base station.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination for listening for an open time slot, frequency, and sector because this would increase effectiveness of communications, and would achieve higher density communications since more sensors can be serviced per base station.

9. **Claims 51-52 and 54-56** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bary et al. (US Patent Number 5,822,273) in view of Savit (US Patent Number 3,990,036), and further in view of Schneider (US Patent Number 6,240,094).

Regarding **claims 51-52**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 12*). In addition, Bary et al. discloses determining if the data includes errors (column 12, line 25).

However, the combination fails to particularly disclose retransmitting the data if the data includes errors; and retransmitting the data during a non-active time.

Schneider teaches a method for retransmission of data when it is detected that the data includes errors (see column 5, lines 52-56); and retransmitting the data during a non-active time (at least inherently) (see column 3, lines 45-55).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination for retransmitting the data if the data includes errors because this would ensure accurate communications; and retransmitting the data during a non-active time because this would avoid unnecessary system overloading.

Regarding **claim 54**, Bary et al. and Savit disclose everything claimed as applied above (see *claim 12*). In addition, Bary et al. discloses that the seismic acquisition system includes a plurality of communication channels (fk1 to fkq – column 17-20) and wherein transmitting data from the sensors to the base stations further includes:

selecting a channel (frequency) for transmission from the sensor to the base station (column 5, lines 57-62, column 17-29); and

if the selected channel is available, then transmitting the information from the sensor to the base station (column 5, lines 57-62, column 17-29).

If the selected channel is available, then the step "if no channels are available, then waiting until channel is available" does not occur, nor occurs "if the selected channel is impaired, then selecting another channel".

If all of the information has not been properly transmitted (as explained below), then the step "if all of the information has been properly transmitted, then adjusting to a lower order modulation and transmitting control information from the base station to the sensor" does not occur.

However, the combination fails to particularly disclose transmitting a request for retransmission from the base station to the sensor if all of the information has not been properly transmitted and adjusting to a lower order modulation as claimed.

Schneider teaches a method for transmitting a request for retransmission from the base station to the sensor if all of the information has not been properly transmitted and adjusting to a lower order modulation as claimed (see column 5, lines 52-56, column 3, lines 45-55).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination for transmitting a request for retransmission from the base station to the sensor if all of the information has not been properly transmitted and adjusting to a lower order modulation because this would ensure accurate communications.

Regarding **claims 55-56**, Bary et al., Savit and Schneider disclose everything claimed as applied above (see *claim 54*). In addition, Bary et al. discloses using the sensor to monitor the communication channels, and using the sensor to maintain record of the available channels (in memory M1, M2, M3 and/or Mp) (column 6, line 32 to column 7, line 12).

10. **Claim 53** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bary et al. (US Patent Number 5,822,273) in view of Savit (US Patent Number 3,990,036), and further in view of Mahany (US Patent Number 5,696,903).

Regarding **claim 53**, Bary et al. discloses everything claimed as applied above (see *claim 12*). In addition, Bary et al. discloses that the sensors are positioned at different distance from a base station (see Figure 1), the method including transmitting information from one of the sensors to the base station (column 11, lines 30-40).

However, the combination fails to particularly disclose that if the sensor is a nearby sensor, then adjusting the modulation in the communication channel to increase the data density. Nevertheless, it should be noted that if the sensor is a nearby sensor the quality of communications is better that if located far away.

In the same field of endeavor, Mahany discloses a method with adaptive data rate (data density) based on the quality of communications (column 11, lines 20-25, column 59, lines 57-

61). If the quality of communications is good an increased data rate (data density) can be achieved.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination for adjusting the modulation in the communication channel to increase the data density if the sensor is a nearby sensor because if the sensor is a nearby sensor the quality of communications is much better and increased the data density is desirable for faster data transfer.

Response to Arguments

11. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Even though arguments are moot as indicated above, and as they are directed to new changes presently made, for clarification of the record the following remarks are made.

In response to applicant's argument, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

As indicated above Savit discloses that in the case of multichannel sensors, a switching system must be used to change channel assignments (column 1, lines 45-47), and that each sensor is equipped with the switching means (column 1, line 64). Because each of the sensors comprise the explained switching mechanism <u>and</u> such switching mechanism is in fact used to change (select) channel assignments, each of the explained seismic sensors select a channel

assignment for transmitting the signals as claimed, by means of the explained switching mechanism.

Conclusion

12. Any inquiry concerning this communication from the examiner should be directed to Eliseo Ramos-Feliciano whose telephone number is 571-272-7925. The examiner can normally be reached from 8:00 a.m. to 5:30 p.m. on 5-4/9 1st Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold, can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ELISEO RAMOS-FELICIANO
PRIMARY EXAMINER

ERF/erf
May 12, 2006